



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,818	02/25/2005	Tatsuya Maruo	0171-1184US1	9190

2292 7590 06/06/2008
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
----------	--------------

1795

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

06/06/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No. 10/525,818	Applicant(s) MARUO ET AL.	
	Examiner Jonathan S. Crepeau	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :2/25/05 2/1/07
4/19/07 4/15/08 .

DETAILED ACTION

Claim Objections

1. Claim 12 is objected to because of the following informalities: in line 2, “□m” should be corrected.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1, 2, and 5-11 are rejected under 35 U.S.C. 102(a) as being anticipated by WO 02/076924. Sato (U.S. Patent 7,297,289) is taken as an English language equivalent herein. Sato ‘289 discloses an electrolyte comprising an ionic liquid having the chemical structure recited in instant claims 7 and 8 (see col. 3, line 40). Further, a secondary battery containing the electrolyte is disclosed (see col. 5, line 49). The electrolyte contains ethylene carbonate or propylene carbonate, which is the “compound” of instant claims 1 and 2, and a lithium salt (see sol. 5, line 12; col. 12, line 4). Regarding claim 2, ethylene carbonate inherently possesses the claimed characteristic. The ionic liquid has a melting point not higher than 25 degrees C.

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over McEwen et al (U.S. Pre-Grant Publication No. 2002/0110739) in view of Matsumoto et al (*Electrochemical Society Proceedings*, 2000).

McEwen et al. teach a lithium ion battery comprising a positive electrode comprising a lithium containing double oxide, a negative electrode comprising a carbonaceous material, and a separator (see claim 1; [0088]). The electrolyte comprises a molten salt that may have an ammonium cation and a monovalent anion such as BF₄ (see Figs. 1 and 2). The electrolyte further comprises a lithium salt (see [0049]) and a solvent such as ethylene carbonate (see [0050]), which corresponds to the "compound" of instant claim 1. Regarding claim 2, ethylene carbonate inherently possesses the claimed characteristic.

McEwen et al. do not expressly teach that the ammonium cation comprises at least one R group that is an alkoxyalkyl group, as recited in claim 1.

Matsumoto et al. is directed to room temperature molten salts based on quaternary ammonium cations. On page 188, the reference teaches compounds called "TMMOMe" and "DMEMOMe" that each have an R group comprising a -CH₂-O-CH₃ group.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the molten salt of Matsumoto et al. in the battery of McEwen et al. Matsumoto et al. teach that their salts are suitable for use in lithium batteries, and the salts have high conductivity. Accordingly, the artisan would be motivated to use the molten salt of Matsumoto et al. in the battery of McEwen et al. These salts inherently have a melting point not exceeding 25 degrees C, as recited in claim 6.

Regarding claims 3 and 4, which recite weight percentages of the compound, i.e., solvent, these ranges are not considered to distinguish over the references. The amount of solvent may be optimized to affect viscosity and conductivity of the electrolyte, among other parameters. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Regarding claim 12, the thickness and porosity of the separator may also be optimized to affect internal resistance of the battery. As such, these ranges are also not considered to distinguish over the references.

Regarding claims 7 and 8, which recite that the R group is -CH₂CH₂-O-R', it is noted that Matsumoto et al. only teach -CH₂-O-R'. However, the insertion of methyl groups between other functionalities was held to be within the skill of the art. *Ex parte Biel* 124 USPQ 109 (1958); *Ex parte Burtner* 89 USPQ 547 (1950). Further, claim 8 recites that two R groups are ethyl, while Matsumoto et al. teach that DMEMOMe has only one ethyl R group and two methyl groups. However, the substitution of another ethyl group for a methyl group is also considered

to be an obvious variant of the compound of Matsumoto et al. Accordingly, the compounds of claims 7 and 8 are considered to be obvious over the compounds of Matsumoto et al.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over McEwen et al. in view of Matsumoto et al. as applied to claims 1-12 above, and further in view of Takekawa et al (U.S. Pre-Grant Publication No. 2002/0081485).

McEwen et al. do not expressly teach that the separator is primarily composed of cellulose, as recited in claim 13.

In [0069], Takekawa et al. teach a lithium secondary battery comprising a cellulose separator.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Takekawa et al. identify cellulose, polyethylene, and polypropylene as being suitable separator materials. Therefore the skilled artisan may ascertain that cellulose would function as an equivalent of PE or PP when used in a lithium battery.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-11 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 7,297,289. Although the conflicting claims are not identical, they are not patentably distinct from each other because the ‘289 patent claims anticipate some of the instant claims and are sufficient to render the remaining claims obvious.

9. Claims 1-11 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 7,154,737. Although the conflicting claims are not identical, they are not patentably distinct from each other because the

recitation of a “compound” (e.g, ethylene carbonate) in claim 1 would be obvious over the ‘737 claims because these materials are known for use in nonaqueous secondary cell electrolytes.

10. Claims 1-11 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 7,347,954. Although the conflicting claims are not identical, they are not patentably distinct from each other because the recitation of a “compound” (e.g, ethylene carbonate) in claim 1 would be obvious over the ‘954 claims because these materials are known for use in nonaqueous secondary cell electrolytes.

11. Claims 1-11 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-7 of U.S. Patent No. 7,167,353. Although the conflicting claims are not identical, they are not patentably distinct from each other because the recitation of a lithium salt in claim 1 would be obvious over the ‘353 claims because these materials are known for use in nonaqueous secondary cell electrolytes.

12. Claims 1-11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Serial No. 11/537,269. Although the conflicting claims are not identical, they are not patentably distinct from each other

because the '269 claims anticipate some of the instant claims and render the remaining claims obvious.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795
June 4, 2008